

Claims

[1] 1. A storage medium storing:
moving picture data having a plurality of playback routes;
a plurality of subtitle data items corresponding to the playback routes and
supporting random search for a subtitle; and
mapping information linking the moving picture data and the subtitle data.

2. The storage medium of claim 1, wherein the subtitle data includes reference
offset information indicating reference information to randomly search for a
subtitle of a desired time at a high speed and reproduce the subtitle, text data
containing subtitle contents that are converted into pixel data and output, style
information specifying an output style of the pixel data, and control information
to control the output of the converted pixel data.

3. The storage medium of claim 2, wherein by using information on a time
elapsed from the reference offset information, the subtitle of a desired time is
randomly searched for at a high speed among the subtitle data.

4. The storage medium of claim 3, wherein the reference offset information
includes a cell identifier (VOB_ID and CELL_ID) of a video object that is a
recording unit of the storage medium, or a start position of a clip that is a
recording unit of the storage medium.

5. The storage medium of claim 2, wherein the subtitle data is described in the
form of a markup language or a binary table.

6. The storage medium of claim 5, wherein in the subtitle data described in the
form of a binary table, the style information, the control information, and the text
information have respective identifiers for distinguishing each other, and the
control information includes indication information indicating the style in-
formation and the text information corresponding to the control information, and
in order to reduce a search time by integer calculation when random search is
performed, the size of each of the style information and the control information
is predetermined and sequentially recorded in a predetermined area.

7. The storage medium of claim 2, wherein the style information includes at least
one among information items on the width and height of the pixel data area, a
background color, a time when the pixel data is to be stored and deleted in a
buffer memory, a starting point from which subtitle text is rendered, line spacing,
output direction, bold type and Italic type of subtitle text, line break, color of

subtitle text, and information on character code encoding.

8. The storage medium of claim 2, the control information includes at least one among information items on an area on which the pixel data is to be output on the entire screen, a start point of subtitle text in the area, and a synchronization time indicating when the pixel data is to appear and disappear in synchronization with the moving picture data.

9. The storage medium of claim 8, wherein the synchronization time information is expressed as a lapse time from a reference cell (CELL) of a video object (VOBU) that is reference offset information of the moving picture data, or as a lapse time from a start position of a clip that is reference offset information of the moving picture data.

10. The storage medium of claim 9, wherein the synchronization time information is expressed by using a present time stamp (PTS) time on the basis of a reference time for reproducing moving pictures.

11. The storage medium of claim 1, wherein the subtitle data or the mapping information further includes at least one among font information describing the font of subtitle data to be displayed on the screen, information on a producer making the subtitle, packet identifier (PID) information of the subtitle data to distinguish from the moving picture data, and subtitle indication information by language of the subtitle data.

12. A reproducing apparatus for reproducing a storage medium on which moving picture data is recorded, the apparatus comprising:

a decoder decoding the moving picture data having a plurality of playback routes; and

a subtitle processor converting subtitle data corresponding to a predetermined route and selected by using a plurality of subtitle data items corresponding to the playback routes and supporting random search for a subtitle and mapping information linking the moving picture data and the subtitle data, into pixel data, and synchronizing the converted pixel data with the moving picture data and outputting the pixel data.

13. The apparatus of claim 12, wherein the subtitle processor comprises:

a text subtitle decoder identifying subtitle data corresponding to the moving picture data of a route to be reproduced by parsing the mapping information, and converting the identified subtitle data into pixel data by parsing the subtitle data; and

a graphic controller controlling the pixel data by using the parsed mapping information and subtitle data such that the pixel data is synchronized with the moving picture data and output.

14. The apparatus of claim 13, wherein in the subtitle data, by decoding the subtitle data, the text subtitle decoder parses reference offset information indicating reference information to randomly search for a subtitle of a desired time at a high speed and reproduce the subtitle, text data containing subtitle contents that are converted into pixel data and output, style information specifying an output style of the pixel data, and control information to control the output of the converted pixel data, and based on the style information, converts the text data into pixel data, and by using the parsed control information, the graphic controller controls such that the converted pixel data is synchronized with the moving picture data and output.

15. The apparatus of claim 14, wherein the text subtitle decoder randomly searches the subtitle data for the subtitle of a desired time at a high speed by using information on a time elapsed from the reference offset information.

16. The apparatus of claim 15, wherein by using synchronization time information expressed as a lapse time from a reference cell (CELL) of a video object (VOBU) that is reference offset information of the moving picture data, or as a lapse time from a start position of a clip that is reference offset information of the moving picture data, the graphic controller controls the converted pixel data to be synchronized with the moving picture data and output.

17. A method for reproducing data on a storage medium storing moving picture data having a plurality of playback routes, a plurality of subtitle data items corresponding to the playback routes and supporting random search for a subtitle, and mapping information linking the moving picture data and the subtitle data, the method comprising:

reading the subtitle data corresponding to moving picture data of a route to be reproduced by parsing the mapping information;

identifying subtitle data of a position to be reproduced according to continuous reproduction or reproduction by random search, by parsing the subtitle data, and converting the subtitle data into pixel data; and

synchronizing the converted pixel data with the moving picture data and outputting the pixel data.